Pacific Gas and Electric Company®

Mailing Address:
Pacific Gas & Electric Company
Gateway Generating Station
3225 Wilbur Ave.
Antioch, CA 94509
(925) 522-7801

September 16, 2010

Mr. Jack Caswell
Compliance Program Manager
California Energy Commission
1516 Ninth Street, MS-2000
Sacramento, CA 95814

Reference: PG&E Gateway Generating Station (00-AFC-01C)

Subject: PETITION FOR INSIGNIFICANT PROJECT CHANGE TO PLANT FACILITY

Dear Mr. Caswell,

After nearly two years of operation, we have discovered the need to perform several minor changes at our facility. In reviewing these changes, we find that they do not require any change to our Conditions of Certification; however, in an abundance of caution, I am submitting the enclosed petition for your approval.

Enclosed is PETITION FOR INSIGNIFICANT PROJECT CHANGE TO PLANT FACILITY to include the following modifications:

1. Replacement of trailer-mounted demineralized water treatment package with rack-mounted Reverse Osmosis (RO) system.

2. Installation of roof covers to protect the following equipment/devices:
   a. Two (2) DCS Cabinets on HRSG A and HRSG B
   b. Four (4) Boiler Feed-water Pump Motors on HRSG A and HRSG B.
   c. Gas Chromatograph
   d. Trash Bins
   e. Reverse Osmosis (RO) System

3. Addition of pre-fabricated metal utility shed for storage of maintenance and mechanical equipment

4. Addition of two "TUFF" metal sheds for storage of electrical grounding equipment.

5. Addition of two hazardous material/waste storage metal sheds

We reviewed the Commission Decision (00-AFC-1); and we believe that the above requested insignificant modifications will not result in any new environmental impacts or require any modifications to the existing Conditions of Certification contained in the Final Decision. If you have any questions regarding this letter, please contact Angel Espiritu at (925) 522-7838.

Sincerely,

Ronald A. Gawer
Senior Plant Manager

Enclosure: a/s
Cc: File

PETITION FOR INSIGNIFICANT PROJECT CHANGES
AT
GATEWAY GENERATING STATION

1. Replacement of Trailer-mounted Demineralized Water Treatment Package with Rack-mounted Reverse Osmosis System

   a. **Description of Modification:** This modification proposes to replace the existing trailer-mounted demineralized water treatment package with rack-mounted reverse osmosis (RO) system that includes a water polisher. The new installation with area dimension of 5' x 20' will be staged within the existing bermed area (28' x 50'). (See Attachment A: Marked-up Facility Layout for location of the proposed modification.) The RO system will utilize less than 50 gallons each at any given time of sodium hydroxide, sodium bi-sulfite, and Vitec 3000 (a proprietary product with mostly sodium hydroxide as a component). Both sodium hydroxide and sodium bi-sulfite are listed in HAZ-1 Appendix C Table 8.12-4 of the Commission Decision 900-AFC-1). (See Attachment B: RO System Process Description and Flow Diagram.)

   b. **Necessity for the Modification:** The existing trailer-mounted demineralized water treatment package requires that the old 40-foot trailer be pulled out and replaced with new one once every two to three weeks. Movement of the trailer has potential safety concerns to property and employees with handling of heavy hoses and also increased potential for spillage of processed water. With the use a rack-mounted RO system, this safety issue will be eliminated as the rack-mounted RO system will not need to be pulled out for replacement, as it is a fixed structure. (The RO system, though, will need to replace filters occasionally.) Also, the RO system package has associated monetary cost saving.

   c. **Modification was not known at the time of Certification:** The need for modification become apparent only after several months of normal operation.

   d. **If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, an explanation of why the change should be permitted:** The modification does not change or undermine in any way the assumptions, rationale, findings, or other basis of the CEC Final Decision (00-AFC-1).

   e. **Analysis of the impacts the modification may have on the environment:** The replacement of the trailer-mounted water treatment package (demineralizer) with rack-mounted water treatment package (RO System) will have no significant adverse impacts on the environment. The RO reject water will be discharge through the Delta Diablo Sanitation

District (DDSD) treatment system. (See Attachment C: DDSD's Approval of RO Reject Water to their Treatment System.)

f. **Analysis on the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards:** The proposed modification does not impact the facility's ability to comply with all applicable laws, ordinances, regulations, and standards.

g. **A discussion of how the proposed modification affects the public:** This modification will have no adverse effect on the public. The visual impact of the modification will, in fact, be reduced from a 40-footer trailer water treatment package to a rack-mounted RO system occupying a surface area with approximate dimension of 5' x 20'. The change, however, will not likely be noticeable to the public as there are tanks and a building existing between the system and the property boundary.

h. **Property owners potentially affected by the modification** It is anticipated that no property owners will be affected by the proposed modification.

2. Roof Covers

a. **Description of Modification:** This modification proposes the installation of roof covers using steel structures (whenever applicable and available) to protect equipment/devices form rain and other out-door elements. The roof covers will be installed on the following:

1. Two (2) DCS Cabinets (20' x 30') one each at HRSG-A and HRSG-B at elevation 35 feet above grade level. The roof cover will be attached to existing structural frames. (See Attachment A: Marked-up Facility Layout, labeled 2.a.1, for site location.)

2. Four (4) Boiler Feed-water Pumps (10' x 10') two each at HRSG-A and HRSG-B on grade level. The roof cover will be attached to existing structural frames. (See Attachment A: Marked-up Facility Layout, labeled 2.a.2, for site location.)

3. Gas Chromatograph (3' x 4') in the gas yard on grade level. The cover will be attached to existing structural frames. (See Attachment A: Marked-up Facility Layout, labeled 2.a.3, for site location.)

4. Trash Bins (10' x 16') on ground level. There will be additional six columns (10' H) to support this roof cover. (See Attachment A: Marked-up Facility Layout, labeled 2.a.4, for site location.)

5. RO equipment (10' x 50') and (12' x 18') on grade level and on existing concrete floor. There will be additional columns (10' H) to

support the roof cover. (See Attachment A: Marked-up Facility Layout, labeled 2.a.5, for site location.)

b. **Necessity for the Modification:** The installation of roof covers is needed to protect the equipment/devices from rain water and other out-door elements. The functionality of some equipment in the above list, e.g. DCS cabinets, gas chromatograph, motors, and water treatment package can be impacted, hence, may potentially trip the power generating units, when allowed to remain exposed to rain water and other elements. This issue was made obvious upon discovery of water damage to the internals of several pieces of equipment. Hence, to ensure continued operational availability of the facility, the roof covers are needed. Also, the cover on the trash bin can enhance the existing facility SWPPP best management practice (BMP) by preventing water intrusion into the bins, which can potentially be discharge on the ground and the storm water system of the site. On both cases, the installation of roof covers aims to mitigate the identified impacts.

c. **Modification was not known at the time of Certification:** The need for modification become apparent only after several months of normal operation.

d. **If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, an explanation of why the change should be permitted:** The modification does not change or undermine in any way the assumptions, rationale, findings, or other basis of the CEC Final Decision (00-AFC-1).

e. **Analysis of the impacts the modification may have on the environment:** The installation of roof covers on the indicated equipment/devices will have no significant adverse impacts on the environment. The visual impact of the proposed installation will be minimal and will not likely be noticeable to the public. The roof cover will be painted to match the existing CEC approved color for the facility and will blend in with existing structure.

f. **Analysis on the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards:** The proposed modification does not impact the facility's ability to comply with all applicable laws, ordinances, regulations, and standards.

g. **A discussion of how the proposed modification affects the public:** This modification will have no adverse effect on the public. The minimal visual impact will be mitigated by painting the structure with color that matches the existing CEC approved color for the facility.

h. **Property owners potentially affected by the modification** It is anticipated that no property owners will be affected by the proposed modification

3. Pre-fabricated Utility Sheds

a. **Description of Modification:** This modification proposes to install a pre-fabricated metal utility shed with dimension: 16' x 40' x 10' H, to store maintenance and mechanical equipment. Concrete flooring will be provided for this installation. (See Attachment A: Marked-up Facility Layout, labeled 3, for location of the proposed modification.) (See Attachment D: Photo of Typical Pre-fabricated Metal Shed.)

b. **Necessity for the Modification:** The utility shed will protect maintenance and mechanical equipment from being exposed to rain and other out-door elements. This modification will protect property and ensure continued availability of critical tools for maintaining continued operation of the facility.

c. **Modification was not known at the time of Certification:** The need for modification become apparent only after several months of normal operation.

d. **If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, an explanation of why the change should be permitted:** The modification does not change or undermine in any way the assumptions, rationale, findings, or other basis of the CEC Final Decision (00-AFC-1).

e. **Analysis of the impacts the modification may have on the environment:** The installation of the utility shed will have no significant adverse impact on the environment. The visual impact of the proposed modification is negligible as the shed will not visible from any property line. The metal shed will be painted with color that matches the existing CEC approved color for the facility.

f. **Analysis on the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards:** The proposed modification does not impact the facility's ability to comply with all applicable laws, ordinances, regulations, and standards.

g. **A discussion of how the proposed modification affects the public:** This modification will have no adverse effect on the public.

h. **Property owners potentially affected by the modification** It is anticipated that no property owners will be affected by the proposed modification

4. Metal “Tuff” Sheds

a. **Description of Modification:** This modification proposes to install two (2) metal “Tuff” sheds with dimension: 10’ x 12’ x 8’H, on grade level to store electrical grounding equipment. (See Attachment A: Marked-up Facility Layout, labeled 4, for location of the proposed modification.)

b. **Necessity for the Modification:** The metal “Tuff” sheds are needed to enhance safety and protection of personnel and property. The electrical grounding equipment, which will be stored in the sheds, is critical to safe operation and maintenance of the facility. The sheds will protect vital equipment from being exposed to rain and other out-door elements, hence ensuring continued availability of properly maintained equipment.

c. **Modification was not known at the time of Certification:** The need for modification become apparent only after several months of normal operation.

d. **If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, an explanation of why the change should be permitted:** The modification does not change or undermine in any way the assumptions, rationale, findings, or other basis of the CEC Final Decision (00-AFC-1).

e. **Analysis of the impacts the modification may have on the environment:** The installation of the utility shed will have no significant adverse impact on the environment. The visual impact of the proposed modification is minimal and will not likely be noticeable to the public. The minimal visual impact will be mitigated by painting the metal sheds with color that matches the existing CEC approved color for the facility.

f. **Analysis on the impact of the modification on the facility’s ability to comply with applicable laws, ordinances, regulations, and standards:** The proposed modification does not impact the facility’s ability to comply with all applicable laws, ordinances, regulations, and standards.

g. **A discussion of how the proposed modification affects the public:** This modification will have no adverse effect on the public.

h. **Property owners potentially affected by the modification** It is anticipated that no property owners will be affected by the proposed modification.

5. Portable Metal Sheds for Hazardous Materials/Waste Storage

a. **Description of Modification:** This modification proposes to install two (2) portable metal sheds with dimension: 5.5' x 25.5' x 8.5'H, on grade level to store hazardous materials/waste. (See Attachment A: Marked-up Facility Layout, labeled 5, for location of the proposed modification.) The shed is equipped with secondary containment, fire suppression equipment, and eye-wash station. (See Attachment E: Hazardous Materials/ Waste Shed Specification). The hazardous material/waste storage is a component part of the Waste Management Plan for the facility. The plan was submitted to CEC to comply with Condition of Certification WASTE-2 on December 3, 2008.

b. **Necessity for the Modification:** The installation of portable metal sheds for hazardous materials/waste storage is needed to comply with the facility's commitment with its Waste Management Plan

c. **Modification was not known at the time of Certification:** The actual specification for the proposed sheds was not known at the time of certification, but the need for the hazardous materials/waste storage is required under the facility's Waste Management Plan.

d. **If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, an explanation of why the change should be permitted:** The modification does not change or undermine in any way the assumptions, rationale, findings, or other basis of the CEC Final Decision (00-AFC-1).

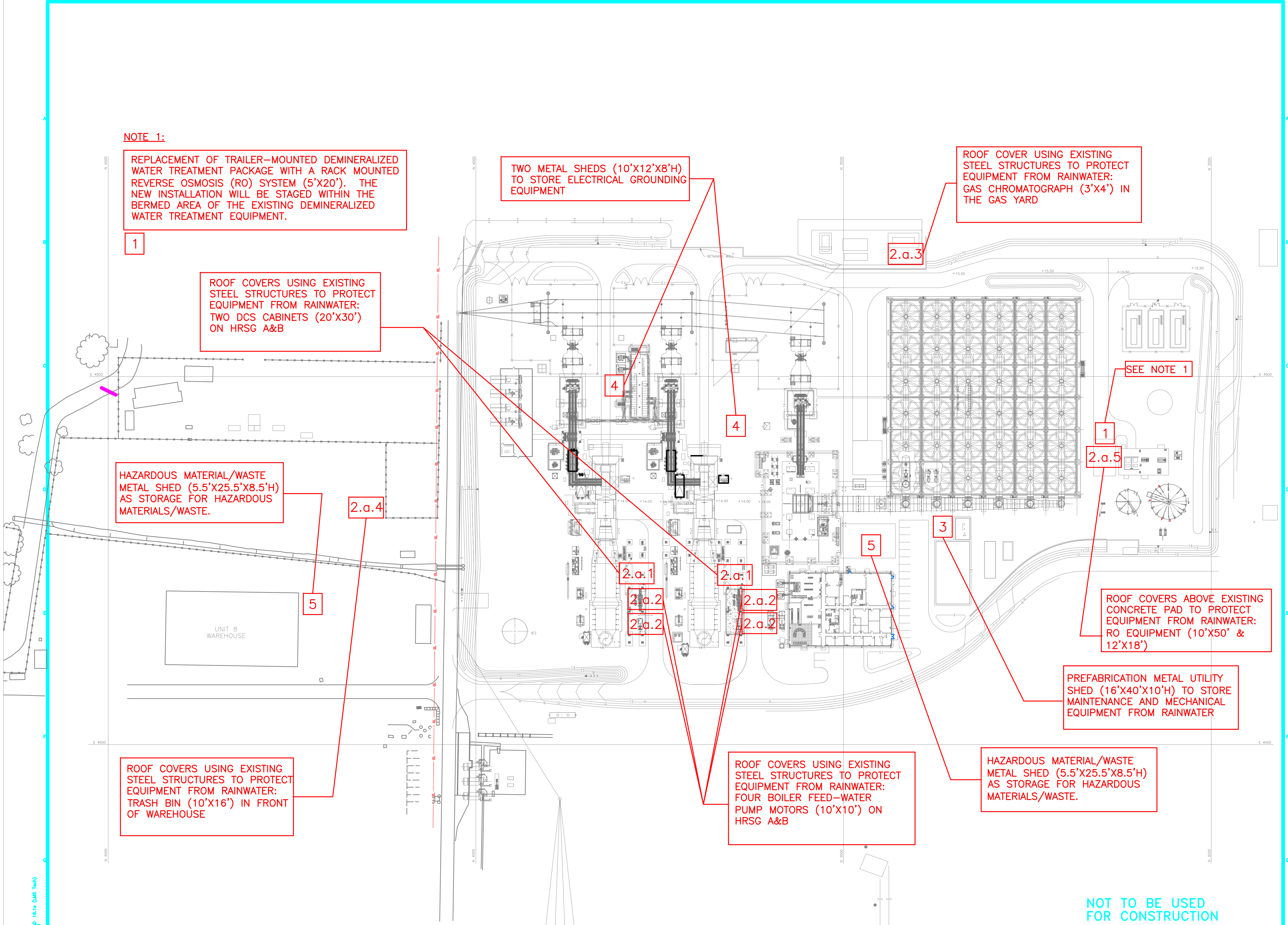
e. **Analysis of the impacts the modification may have on the environment:** The installation of the metal sheds will have no significant adverse impact on the environment. In fact, the sheds are needed to more effectively manage hazardous materials/waste at the site, hence, protecting the environment.

f. **Analysis on the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards:** The proposed modification does not impact the facility's ability to comply with all applicable laws, ordinances, regulations, and standards.

g. **A discussion of how the proposed modification affects the public:** This modification will have no adverse effect on the public.

h. **Property owners potentially affected by the modification** It is anticipated that no property owners will be affected by the proposed modification

ATTACHMENT A
MARKED-UP FACILITY LAYOUT



NOTE 1:
REPLACEMENT OF TRAILER–MOUNTED DEMINERALIZED WATER TREATMENT PACKAGE WITH A RACK MOUNTED REVERSE OSMOSIS (RO) SYSTEM (5'X20'). THE NEW INSTALLATION WILL BE STAGED WITHIN THE BERMED AREA OF THE EXISTING DEMINERALIZED WATER TREATMENT EQUIPMENT.
1
TWO METAL SHEDS (10'X12'X8'H) TO STORE ELECTRICAL GROUNDING EQUIPMENT
ROOF COVER USING EXISTING STEEL STRUCTURES TO PROTECT EQUIPMENT FROM RAINWATER: GAS CHROMATOGRAPH (3'X4') IN THE GAS YARD
2.a.3
ROOF COVERS USING EXISTING STEEL STRUCTURES TO PROTECT EQUIPMENT FROM RAINWATER: TWO DCS CABINETS (20'X30') ON HRSG A&B
SEE NOTE 1
4
4
1
2.a.5
HAZARDOUS MATERIAL/WASTE METAL SHED (5.5'X25.5'X8.5'H) AS STORAGE FOR HAZARDOUS MATERIALS/WASTE.
2.a.4
3
5
2.a.1
2.a.1
2.a.2
2.a.2
2.a.2
2.a.2
ROOF COVERS ABOVE EXISTING CONCRETE PAD TO PROTECT EQUIPMENT FROM RAINWATER: RO EQUIPMENT (10'X50' & 12'X18')
5
UNIT 8 WAREHOUSE
PREFABRICATION METAL UTILITY SHED (16'X40'X10'H) TO STORE MAINTENANCE AND MECHANICAL EQUIPMENT FROM RAINWATER
ROOF COVERS USING EXISTING STEEL STRUCTURES TO PROTECT EQUIPMENT FROM RAINWATER: TRASH BIN (10'X16') IN FRONT OF WAREHOUSE
ROOF COVERS USING EXISTING STEEL STRUCTURES TO PROTECT EQUIPMENT FROM RAINWATER: FOUR BOILER FEED–WATER PUMP MOTORS (10'X10') ON HRSG A&B
HAZARDOUS MATERIAL/WASTE METAL SHED (5.5'X25.5'X8.5'H) AS STORAGE FOR HAZARDOUS MATERIALS/WASTE.

NOT TO BE USED FOR CONSTRUCTION

MAR50303 ACAD 16.1s (LMS Tech)
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05/03/07 12:15:56

NO	DATE	REVISIONS AND RECORD OF ISSUE	DWN/CKD/APP
3	05-04-2007	ISSUED TO AHJ FOR APPROVAL	
2	01-03-2001	REVISED HYDRANT LOCATIONS	ECB/LBP/BAS/DCM
1	12-17-2001	REVISED HYDRANT LOCATIONS	LLB/LBP/BAS/DCM
0	11-29-2001	INITIAL ISSUE	LLB/LBP/BAS/DCM

40' 20' 0 40' 80'
1"=80'

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CALIFORNIA.
SIGNED JAMES J. SATIN
DATE 04-26-2007 REG NO. M33608

BLACK & VEATCH CONSTRUCTION, INC.
ENGINEER BAS DRAWN LLB
CHECKED DATE

PACIFIC GAS & ELECTRIC CO.
GATEWAY GENERATING STATION
FACILITY LAYOUT

PROJECT / DRAWING NUMBER: 065108-DM-1033
REV 3

ATTACHMENT B

REVERSE OSMOSIS SYSTEM (RO): PROCESS DESCRIPTION AND FLOW DIAGRAM

SIEMENS

Siemens Water Technologies Corp.
Integrated Solutions
2501 N. Barrington Road
Hoffman Estates, IL 60192
Phone – (847) 713-8460 Fax: (847) 713-8480

DATE	June 21, 2010
TO:	Vinh Nguyen
PREPARED BY:	Paul Sandell, paul.sandell@siemens.com (530-672-6774)
SUBJECT:	Scope Package – RO System
CUSTOMER NAME:	**PG&E, Gateway Generating Station**
CUSTOMER LOCATION:	Antioch, CA

SCOPE

PROCESS DESCRIPTION

PG and E Gateway Generating Power Plant will be providing City of Antioch, CA city water mixed with water from the plant Reclaim tank for processing by Siemens. Design includes specialized iron media filtration, 2 pass Reverse Osmosis to minimize the DI loading as much as possible (99.9% mineral removal), caustic interstage feed for complete CO2 removal to protect the anion capacity, and two stage lead/lag Mixed Bed DI Polish. The feed water is detailed in the water analysis shown in Attachment A.

MEDIA FILTER

One (1) Preflex 54"specialized media filter is provided. Unit is 54" in diameter with a 72" side sheet which contains activated media to capture iron. Based on plant feedwater and reclaim testing, the iron levels were very high. Iron poses a high risk for membrane fouling if left untreated.

During maximum production periods (60 gpm demin water) the filter will deliver 95 gpm operating at 6.0 gpm/ft^2. The typical maximum level recommended is 5 gpm/ft^2, so under normal routine conditions, the system will be run at 50 gpm demin water. This reduction will lower the pretreatment flux to appropriate typical 5 gpm/ft^2, allowing us to only use 1 filter unit. The differential pressure across the filter will be continuously monitored and a backwashing sequence will be automatically initiated when an increase in pressure loss of 10 psi is noted across the beds. Backwash wastewater will be sent to the backwash holding tank prior to being regulated out to the city sewer along with the RO reject flow.

1ST PASS REVERSE OSMOSIS

Filtered water will be fed to the first pass reverse osmosis unit. The RO unit provided is arranged in a 2x2x1-4M array and containing (20) 365 ft^2 membrane modules. The RO unit will operate at a maximum 70% recovery with a conservative flux of 12.6 gfd. The RO train is capable of producing 70 gpm which will be fed to the downstream second pass RO unit. RO reject will be direct fed to PG and E for sewer disposal.

SODIUM HYDROXIDE FEED SYSTEM

Caustic will be added to the first pass RO product water. Carbon dioxide, which is not rejected by the RO membranes, will be converted to alkalinity, which is rejected by the RO membranes. This will significantly reduce the load on the mixed-bed units used to polish the RO product water. The sodium hydroxide feed system will be automatically controlled by an on-line pH monitor. At the maximum production rate (60 gpm demin water), it is expected that the daily usage of 15% sodium hydroxide will be <.25 gallons per day.

2ND PASS REVERSE OSMOSIS

One second-pass RO units is provided, arranged in a 1x1x1-4M array and containing (12) 350 ft^2 membrane modules. The RO units operate at 85-90% recovery with a conservative flux of 18.7 gfd. Reject from the second-pass RO units is recycled to the feed of the first-pass RO units. Note that the second pass RO unit is on the same skid as the first pass RO unit, along with a mixing chamber tube, specifically for caustic reaction time.

MIXED BED POLISHERS-OFF SITE REGENERABLE

Product water from the second-pass RO units is polished through off-site regenerable mixed-bed ion exchange resin vessels arranged in a lead-lag configuration. The polisher will provide the insurance that TDS and silica always meets the final specifications. Two (2) IX48 units will be installed with one in lead and one in lag, each being 48" in diameter and containing 60 ft^3 of mixed-bed resin. Exchange frequency of DI polisher unit is predicted at one every 3 months per tank.

The DI water will be sent to PG and E's 100,000+ gallon DI storage tank. DI Storage tank level signals will be provided to Siemens for RO on/off operations.

EQUIPMENT AND CONTROLS SCOPE OF SUPPLY

The proposed system includes the following equipment and instrumentation.

1. **MEDIA FILTRATION**
   - 1.1. **One (1) Siemens Water Technologies 54" Dia. Media Filter unit**, pre-skidded assembly complete with controls, PVC facepiping, valves, instrumentation.

2. **ANTISCALANT CHEMICAL FEED**
   - 2.1. **One (1) duplex feed pump skid**, one (1) online / (1) installed spare
   - 2.2. **One (1) Day Tank**
   - 2.3. **One (1) Double Containment tank – 110% day tank capacity**

3. **BISULFITE CHEMICAL FEED – Existing Equipment owned by PG and E**
   - 3.1. **One (1) duplex feed pump skid**, one (1) online / (1) installed spare
   - 3.2. **One (1) Day Tank**
   - 3.3. **One (1) Double Containment tank – 110% day tank capacity**

4. **REVERSE OSMOSIS SYSTEM**
   - 4.1. **One (1) Siemens Water Technologies model M284**, Two Pass RO unit, pre-skidded complete with:
     - 4.1.1. **High Pressure Pump**
     - 4.1.2. **480V Power Panel with step-down transformer**
     - 4.1.3. **PLC controls –**
     - 4.1.4. **Caustic Feed injection point on-skid**

5. **INTERSTAGE CAUSTIC CHEMICAL FEED**
   - 5.1. **One (1) feed pump skid**
   - 5.2. **One (1) Day Tank**
   - 5.3. **One (1) Double Containment tank – 110% day tank capacity**

6. **ION EXCHANGE**
   - 6.1. **One (1)IX-48 exchange LEAD DI vessel, 60 cf of mixed bed DI resin**

6.2. **One (1) IX-48 exchange LAG DI vessel, 60 cf of mixed bed DI resin**

7. INSTRUMENTION AND CONTROLS

7.1. The following are in addition to the instruments that are part of each unit operation or listed above.

INSTRUMENT	FEED	DI POLISH
Flow Meter	**Y**	**Y**
Conductivity	**Y**	**Y**
Chlorine	**Y**	
Silica – New Instrument Hach5000		**Y**

Terminal strips, enclosure, and miscellaneous devices.	Y
Remote monitoring.	N
Power distribution	N
Motor Control Center (dual feed)	N
PC, PC accessories, software included where applicable.	N
Class-I, Div. II requirements	N

FEED WATER ANALYSIS: City of Antioch, CA Feed Water analysis mixed with Reclaim

Gateway Generating Station analysis dated 12/2/2009

Constituent	Units	City Water	Reclaim Water
Calcium (Ca)	ppm	14	12
Magnesium (Mg)	ppm	11	9.1
Sodium (Na)	ppm	59	47
Potassium (K)	ppm	3	2.3
Bicarbonate (HCO_3) Alkalinity	ppm as $CaCO_3$	63.6	53.5
Carbonate (CO_3) Alkalinity	ppm as $CaCO_3$	0	0
Sulfate (SO_4)	ppm	34	27
Chloride (Cl)	ppm	85	69
Phosphate (PO4)	ppm as $CaCO_3$	Missing (<1.0)	Missing (<1.0)
Nitrate (NO_3)	ppm as $CaCO_3$	ND	ND
Silica (SiO_2)	ppm	Missing (<30)	Missing (<30)
Conductivity	µ.S/cm	474	397
pH	Standard Unit	8.27	8.02
Carbon Dioxide (CO_2)	ppm	< 2.0	< 2.0
Turbidity	NTU	Missing (< 5.0)	Missing (<5.0)
Free Chlorine (Chloramines)	ppm	3.0 max	0
TOC	ppm	2.3	2.1
O&G	ppm	0.0	0.0
Iron, total (Fe)	ppm	1.0	0.42
Manganese (Mn)	ppm	.083	ND
Temperature	°F	55 - 70	110 MAX

PRODUCT WATER - QUANTITY

Description	Design
Flowrate - GPM	60 gpm, max
Pressure - psig	40
Availability - %	99%

PRODUCT WATER - QUALITY

Quality Parameter	Maximum	Expected
Silica – ppb as ion	< 10 ppb	< 10 ppb
Conductivity – uS/cm	< 1	< 0.1

PG&E, GATEWAY GENERATING STATION FLOW DIAGRAM

CITY WATER

RECLAIM WATER
From plant

Media Filtration Unit

Filtered Water

2 PASS RO UNIT
Mineral Separation

PRODUCT

Chemical Feed
Antiscalent; Bisulfite; 15% caustic

Waste Stream

Backwash line

Waste Storage
Tank, 2,000 gallons

Regulated Discharge to city

Final Quality Check
SiO2 / Cond

Mixed Bed DI Polishing, 60 cf each lead/lag

DI STORAGE TANK

ATTACHMENT C

DDSD's APPROVAL ON DISCHARGE OF RO REJECT WATER TO THEIR TREATMENT SYSTEM

Delta Diablo Sanitation District

OFFICE AND TREATMENT PLANT: 2500 PITTSBURG-ANTIOCH HIGHWAY, ANTIOCH, CA 94509-1373
TEL.: (925) 756-1900 ADMIN. FAX: (925) 756-1961 MAINT. FAX: (925) 756-1963 OPER. FAX: (925) 756-1962 TECH. SVCS. FAX: (925) 756-1960
www.ddsd.org

May 27, 2010

Mr. Angel Espiritu
PG & E Gateway Generating Station
3225 Wilbur Avenue
Antioch, CA 94509

SUBJECT: REVERSE OSMOSIS TREATMENT PROCESS APPROVAL AND DISTRICT TOTAL ISSOLVED SOLIDS TECHNICAL REVIEW

Dear Mr. Espiritu:

Delta Diablo Sanitation District (the District) has reviewed your request to switch over from the current demineralization water treatment process to the new Reverse Osmosis (RO) water treatment system. The District shall grant approval for the use of the RO system.

Please be advised that the District has contractual Total Dissolved Solids (TDS) water quality standard requirement obligations for providing and maintaining recycled water from the District's Recycled Water Facility (RWF) to its customers.

The District is in the process of a technical review regarding TDS contributions to the District's wastewater treatment plant. Pending the outcome of this study, the District may implement future TDS regulations and/or policies to manage this constituent within the District's service area.

If you have any questions, please contact Andrew Kobayashi, District Inspector, at (925) 756-1929. Thank you.

Sincerely,

Darrell Cain

Darrell Cain
Laboratory Manager

DC:zr

cc: Andrew Kobayashi, Industrial Monitoring Inspector, DDSD\
Chron File
NPDES.07.02-PREDOC-1958

N:\pretreatment\Correspondence-SIUs\PGE Gateway RO System Approval and Future TDS 05 10.docx

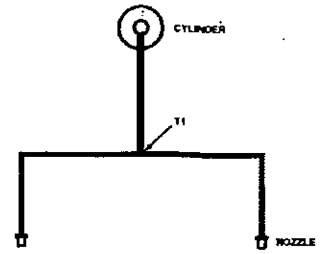
ATTACHMENT D
PHOTO OF TYPICAL PRE-FABRICATED METAL SHED

Photo of Typical Pre-fabricated Metal Shed

ATTACHMENT E

HAZARDOUS MATERIALS/WASTE SHED: SPECIFICATION

PCI-35ABC with 2 nozzles



Total Flooding Piping Limits PCI-35ABC

Cylinder Size	Nozzle Quantity	Nozzle Type	Piping Section	Size	Length Maximum	Elbows Maximum
PCI-35ABC	2	NF-ABC	Cylinder to T1	3/4"	30'	4
			T1 to Nozzle	3/4"	9'	2

NOTE:

1. PCI-35ABC must always use two (2) NF-ABC nozzles.
2. System piping must be balanced. Balanced piping is that in which the difference between the shortest actual pipe length from last tee to nozzle and the longest actual pipe length from last tee to nozzle does not exceed 10% of the longest actual pipe length from last tee to nozzle. The number and type of fittings from all last tee to nozzle sections must be equal.
3. A Main/Reserve Tee Check, Model TC-1, may be located between the cylinder and T1, and counts as two elbows in that section.

splashable hazard exists where liquid fuel in depth greater than 1/4" is present.

3. Total Flooding with ABC

a. Cylinders:

The Models PCI-17ABC, PCI-35ABC, and PCI-70ABC cylinders can be used for ABC total flooding applications.

b. Nozzles:

The Model NF-ABC is used for all ABC total flooding applications.

The Model PCI-17ABC can support one (1) Model NF-ABC nozzle.

The Model PCI-35ABC can support two (2) Model NF-ABC nozzles.

The Model PCI-70ABC can support four (4) Model NF-ABC nozzles.

c. Temperature Ranges:

The operating temperature range for ABC total flooding applications is –20 °F to 120 °F (–29 °C to 48 °C).

d. Piping Requirements:

Piping diagrams include limitations on pipe length and fittings.

e. Nozzle

The nozzle is to be mounted in the center of the protected area, with the discharge holes in the nozzle no greater than six (6) inches from the ceiling. See Figure 3-4

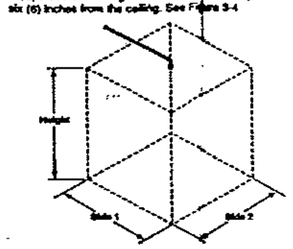


Figure 3-4

f. Nozzle Coverages:

Protection	Nozzle	Specifications Maximum	Nozzle Location Within Protection Zone Length Width Height	Nozzle Offset	Nozzle Orientation
Flooding Area	NF-ABC	Volume – See Table 3-2	Length–Center Width–Center Height–20' maximum	0" - 6"	Vertical

1. General

1.1 – The fire extinguishing system shall be the stored pressure dry chemical pre-engineered fixed nozzle type manufactured by Pyro-Chem. The system shall provide for the protection of the hazardous material storage building(s) described in drawing ______________. (Note drawing number and revision.)

1.2 – The system shall be capable of automatic and manual actuation. It shall be U.L. Listed and installed in conformance with National Fire Protection Association Standard No. 17, "Dry Chemical Extinguishing Systems" and No. 30, "Flammable and Combustible Liquids Code," and comply with all local and/or state Codes and Standards.

1.3 – The system shall be designed for operation at ambient temperatures from –20 °F to 120 °F (–29 °C to 49 °C).

2. Cylinder and Agent

2.1 – Agent. The system shall use Pyro-Chem monoammonium phosphate-based or sodium bicarbonate-based dry chemical agent.

2.2 – Cylinders. Steel cylinders manufactured, tested, and marked in accordance with DOT 4B 350 or DOT 4B 500 shall be used to store the extinguishing agent. Cylinder Models PCI-15ABC shall be used with extinguishing agent fill weight of 12.5 lbs. Cylinder Models PCI-17ABC shall be used with extinguishing agent fill weight of 17 lbs. Cylinder Models PCI-25aABC/BC shall be used with extinguishing agent fill weight of 25 lbs. Cylinder Models PCI-35ABC shall be used with extinguishing agent fill weight of 35 lbs. Cylinder Models PCI-50aABC/BC shall be used with extinguishing agent fill weight of 50 lbs. Cylinder Models PCI-70ABC shall be used with extinguishing agent fill weight of 70 lbs. All models are charged with dry nitrogen to 350 psig at 70 °F.

2.3 – Cylinder valve. A pressure sealed poppet-type valve having a brass body, stainless steel stem with rubber seat washer, fusible safety relief assembly, and pressure gage shall be used on all agent cylinders.

2.4 – Cylinder bracketing. Cylinders shall be mounted vertically. The cylinders shall be secured by use of a steel mounting bracket affixed to a rigid object capable of supporting the weight of the filled cylinder and the concussion of cylinder discharge.

3. Actuation Controls

3.1 – Control Head. The system control head shall include a Model MCH or ECH-Series Control Head. The control head shall be mounted directly on the valve of the agent cylinder (for single cylinder systems), in a Model MB-P2 control head mounting bracket (for actuating up to five centrally located agent cylinders) or directly on the valve of a pneumatic actuating cylinder. A carbon dioxide pilot cartridge that complies with MIL-C0601G shall be used as an integral component of the control head. Control head status shall be visually indicated by a SET/FIRED indicator.

3.2 – Detection. The ambient temperature of the hazard area shall be monitored by fixed temperature mechanical or electrical thermal detectors. When the temperature of the hazard area exceeds the rating of any detector, the detector shall a) release tension in a cable connected to the control head, causing control head activation (for mechanical detectors), or b) close a normally open switch element within the detector, sending a signal to the control head which energizes a solenoid in the control head, exercising the control head (for electrical detectors).

3.3 – Pneumatic actuation. For systems requiring more than five agent cylinders, the system shall have a PAC-Series Pneumatic Actuating Cylinder whose valve opens upon activation of the control head. The valve shall release nitrogen from the PAC cylinder into the pneumatic pipe and tubing network. This nitrogen shall depress a piston above the valve stem in each agent cylinder, opening each agent cylinder valve and releasing the pressurized agent.

3.4 – Manual actuation. The system shall have mechanical manual actuation capability requiring no electrical power. This is accomplished locally by twisting the handle on the cover of the MCH or ECH Control Head, or remotely by means of a Model RPS-M remote mechanical pull station.

3.5 – Auxiliary output. The system shall provide for the shut off of power to equipment within the hazard and to ventilation systems in the event of system actuation. This is accomplished by means of dry contacts on a Model MS-SPOT or MS-DPDT miniature switch installed in the control head. The miniature switch may also be used for auxiliary functions such as audible alarms or alarm signaling.

3.6 – Supervision. A Model SM Series Solenoid Monitor shall be used to supervise the integrity of all electrical actuation circuits, whether automatic or manual.

3.7 – Protection. A weatherproof enclosure designed and installed in conformance with NFPA 17 shall be used to protect the control head and agent cylinder when mounted in an exterior location.

4. Distribution Nozzles

4.1 – Nozzles. The system shall utilize Pyro-Chem discharge nozzles to distribute agent throughout the hazard area. The model, quantity, location, and orientation of nozzles shall be in accordance with Pyro-Chem Industrial Fire Suppression System Technical Manual, Part No. 551228.

4.2 – Nozzle covers. All nozzles shall be installed with nozzle covers to prevent foreign matter from clogging the discharge nozzles.

5. Pipe and Fittings

5.1 – Pipe. All pipe shall be Schedule 40 black, galvanized, chrome plated or stainless steel pipe in compliance with NFPA 17. All pipe ends shall be thoroughly reamed after cutting, and all oil, chips, and debris shall be removed prior to nozzle installation.

5.2 – Fittings. Standard weight malleable, galvanized, chrome plated or stainless steel fittings shall be used.

5.3 – Size. All system pipe and fittings will be sized in accordance with the system Technical Manual. No substitutions are allowed.

5.4 – Joints. No joint sealant shall be used in the discharge piping. Exception: Teflon tape may be used to ensure a snug fit.

5.5 – Straps. All system discharge pipe shall be securely fastened by means of pipe hangers and/or pipe straps. UL Listed pipe hangers shall be used.

5.6 – Union. A union shall be installed in the discharge piping conveniently close to the cylinder valve to permit disconnection for inspection and service.

NOTE

The Model ECH Control Head is supplied with a Model MS-SPOT Miniature Switch. However, this switch must be used in the actuation/detection circuit and cannot be used for electrical output. A Model MS-DPDT must be field installed in the Model ECH Control Head (replacing the MS-SPOT) if electrical output is required.

These switches may be used to provide an electrical signal to the main breaker and/or operate electrical accessories provided the rating of the switch is not exceeded. Wiring connections for the Model MS-SPOT/DPDT are shown in Figure 4-23. The contact ratings for both switches are as follows:

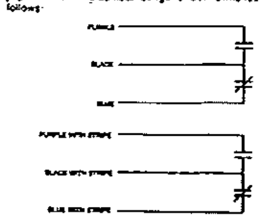


Figure 4-23. Wiring Diagram For Model MS-SPOT/DPDT Miniature Switch.

PIPE AND NOZZLE INSTALLATION

General Piping Requirements

1. Use Schedule 40 black iron (if used in a relatively non corrosive atmosphere) galvanized chrome-plated or stainless steel pipe conforming to ASTM A120, A53 or A106. All fittings must be 300 lb Class minimum. Distribution pipe sizes are 1/2 in, 3/4 in or 1 in depending on number of nozzles.
2. Pipe unions are acceptable.
3. Use reducing tees for all pipe splits.
4. Reducing bushings are not acceptable.
5. Cast iron pipe and fittings are not acceptable.
6. Pipe thread sealant or pipe joint compound is not allowed for distribution piping.
7. Before assembling the pipe and fittings, make certain all ends are carefully reamed and blown clear of chips and scale. Inside of pipe and fittings must be free of oil and dirt.
8. Apply teflon tape on threaded ends. Start at the second male thread, wrapping the tape clockwise around the threads, away from the pipe opening.

CAUTION

Do not apply Teflon tape to cover or overlap the pipe opening, as the pipe and nozzles could become blocked and prevent the proper flow of agent.

Hanger/Support Installation

The hanger/supports must be installed in conjunction with the pipe and fittings. The spacing requirements for hangers/supports depend on the pipe size being utilized, refer to the Spacing Guidelines Chart.

PIPE HANGER SPACING GUIDELINES

Distribution Pipe Size in.	Maximum Spacing Distance Hanger to Hanger ft.
1/4	4
1/2	6
3/4	8
1	12

Other factors that influence hanger/support spacing are:

Hanger/Support must be placed within 1 ft. of the discharge nozzle.

Hanger/Support must be placed between elbows when distance is greater than 2 ft. (0.6 m).

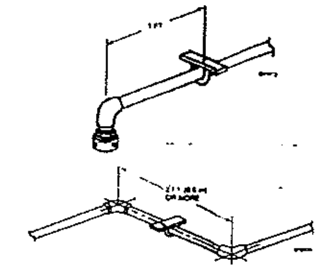


Figure 4-24. Hanger/Support

TABLE 3-2

Total Flooding Nozzle Protection Chart

TABLE 3-1

Total Flooding Nozzle Protection Chart

Maximum Dimensions in feet/nozzle for one (1) Model NF-ABC

Side 1 (ft.)	Nozzle Height (ft.)	Maximum Side 2 (ft.)	Side 1 (ft.)	Nozzle Height (ft.)	Maximum Side 2 (ft.)	Side 1 (ft.)	Nozzle Height (ft.)	Maximum Side 2 (ft.)	Side 1 (ft.)	Nozzle Height (ft.)	Maximum Side 2 (ft.)
3	8	16.70	7	8	15.46	11	8	12.92	15	8	7.94
	9	16.70		9	15.46		9	12.92		9	7.94
	10	16.70		10	15.46		10	11.78		10	7.94
	11	16.70		11	15.46		11	10.71		11	7.85
	12	16.70		12	15.43		12	9.82		12	7.20
	13	16.70		13	14.24		13	9.06		13	6.65
	14	16.70		14	13.22		14	8.42		14	6.17
	15	16.70		15	12.34		15	7.85		15	5.76
	16	16.70		16	11.57		16	7.36		16	5.40
	17	16.70		17	10.89		17	6.93		17	5.08
	18	16.70		18	10.29		18	6.55		18	4.80
	19	16.70		19	9.74		19	6.20		19	4.55
	20	16.70		20	9.26		20	5.89		20	4.32
4	8	16.49	8	8	14.97	12	8	12.00	16	8	5.66
	9	16.49		9	14.97		9	12.00		9	5.66
	10	16.49		10	14.97		10	10.80		10	5.66
	11	16.49		11	14.73		11	9.82		11	5.66
	12	16.49		12	13.50		12	9.00		12	5.66
	13	16.49		13	12.46		13	8.31		13	5.66
	14	16.49		14	11.57		14	7.71		14	5.66
	15	16.49		15	10.80		15	7.20		15	5.40
	16	16.49		16	10.13		16	6.75		16	5.06
	17	16.49		17	9.53		17	6.35		17	4.76
	18	16.49		18	9.00		18	6.00		18	4.50
	19	16.49		19	8.53		19	5.68		19	4.26
	20	16.20		20	8.10		20	5.40		20	4.05
5	8	16.22	9	8	14.39	13	8	10.91			
	9	16.22		9	14.39		9	10.91			
	10	16.22		10	14.39		10	9.97			
	11	16.22		11	13.09		11	9.06			
	12	16.22		12	12.00		12	8.31			
	13	16.22		13	11.08		13	7.67			
	14	16.22		14	10.29		14	7.12			
	15	16.22		15	9.60		15	6.65			
	16	16.20		16	9.00		16	6.23			
	17	15.25		17	8.47		17	5.86			
	18	14.40		18	8.00		18	5.54			
	19	13.64		19	7.58		19	5.25			
	20	12.96		20	7.20		20	4.98			
6	8	15.87	10	8	13.71	14	8	9.59			
	9	15.87		9	13.71		9	9.59			
	10	15.87		10	12.96		10	9.26			
	11	15.87		11	11.78		11	8.42			
	12	15.87		12	10.80		12	7.71			
	13	15.87		13	9.97		13	7.12			
	14	15.43		14	9.26		14	6.61			
	15	14.40		15	8.64		15	6.17			
	16	13.50		16	8.10		16	5.79			
	17	12.71		17	7.62		17	5.45			
	18	12.00		18	7.20		18	5.14			
	19	11.37		19	6.82		19	4.87			
	20	10.80		20	6.48		20	4.63			

Detector Placement.

Thermal detectors are required in all hazard areas protected by the Pyro-Chem Industrial Fire Suppression Systems if automatic system operation is required. Either mechanical or electrical thermal detectors can be used for automatic system operation. Mechanical detectors (fusible links) are used in conjunction with the Pyro-Chem Models MCH, NMCH, and EN-MCU control devices. Electrical detectors are used in conjunction with the Pyro-Chem Models ECH-24 and ECH-120 Control Heads.

A temperature survey must be performed to determine the maximum ambient temperature of the hazard survey. The detectors used to protect a hazard area must be at least 70°F above the maximum ambient temperature.

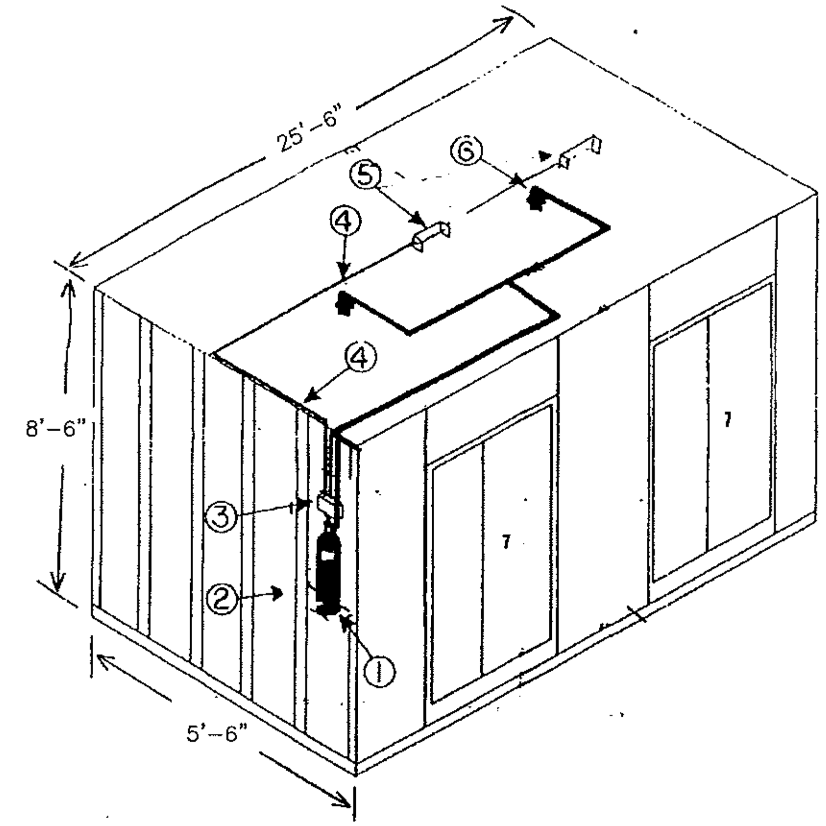
The minimum number of thermal detectors (either mechanical or electrical) required for each hazard area is one detector for each twenty-five (25) pounds of agent required in that hazard area. To determine the number of detectors required in a particular hazard area, divide the total amount of agent required for that hazard area by 25 and round up. Keep in mind that at least one detector is required in every protected hazard area.

Additional detectors may be used to achieve faster system response, however, do not exceed the detector limitations outlined in this manual.

For detector location, evenly divide the protected hazard area into protected zones, with the number of protected zones equal to the number of detectors. Locate a detector at the top center of each protected zone.

NOTE

Refer to NFPA-17 for system design requirements.



FLOOR PLAN
scale as noted

SCOPE OF WORK:

Install new automatic total flood fire suppression system for storage building

GENERAL NOTES:

1. All HVAC equipment and smoke / fire dampers to shut upon discharge
2. System shall be connected to the building fire alarm panel, if provided (by others)
3. System shall be installed in accordance with NFPA 17 and local authority having jurisdaiction

ITEM	PART NUMBER	DESCRIPTION
1	PCI 35ABC	35# ABC DRY CHEM TANK
2	MCH3	MECHANICAL CONTROL HEAD
3	NTFABC	TOTAL FLOOD NOZZLE
4	FLK1	FUSIBLE LINK DETECTOR, 165 DEG.
5	EMT	1/2" EMT CONDUIT
6	SCH40	SCHEDULE 40 PIPE

INDUSTRIAL DRY CHEMICAL TOTAL FLOOD FIRE SUPPRESSION

Delta
FIRE PROTECTION and EQUIPMENT
7356 FULTON AVENUE
NORTH HOLLYWOOD, CA 91605
(818) 764-7990 (818) 764-7852 FAX
CA. Lic. No. C-16 555329

LICENSED ENGINEER

SCOPE OF WORK: INSTALLATION OF A NEW TOTAL FLOOD FIRE SUPPRESSION SYSTEM

PROJECT ADDRESS: PG&E GATEWAY GENERATING STATION
3225 WILBUR AVE.
ANTIOCH, CA. 94509

JOB No.

REVISION:	DATE:
VERSION-1	06-30-09

SHEET: FS-01
FIRE SUPPRESSION

CADD FILE: 2950-01.DWG